Activity Title: Introducing: Plankton!

Subject: Life Science

Grade level: 6-8

Average Learning Time: 40-60 minutes, depending on size of group. Best to use with groups of 24 or less.

Lesson Summary: Students will watch the video "My Secret Life as Plankton" and then discuss in groups what plankton are, various types of plankton, and why plankton is so important.

Overall Concept: What are plankton and why are they so important?

Specific Concepts: They will gain an understanding of what they are, where they are found, the diversity of plankton including the differences between phytoplankton and zooplankton and its importance in the ocean food chain.

Focus Questions:
What are plankton?
Where do they live?
How are they adapted to their environment?
What are some of the characteristics that help the plankton live in their environment?
What are some of the different kinds of plankton?
What is the difference between phytoplankton and zooplankton?
Why are plankton so important?
What is their importance to other organisms in the ecosystem?

Objective: Students will understand what plankton are, where they are found, the different kinds of plankton and their importance.

Materials: Pencils, computer, paper, sticky notes (in various colors) or different colored pens.

Background information: Students should know the definition of adaptation and how they apply to organisms' survival in the environment. If needed, review the definition of adaptation and give several examples of

behaviors as well as characteristics that animals have to survive in their environment.

Common Misconceptions/Preconceptions: Students may believe that plankton are only microscopic and are only found in the ocean. Plankton are very diverse, have a wide variety of sizes, and can be found in any water environment.

Materials: Computer with Internet access, paper, pencils, sticky notes or pens of various colors.

Technical Requirements: Internet Access

Teacher Preparation: Watch the video prior to teaching the lesson, make sure you understand the difference between phytoplankton and zooplankton.

Keywords: Adaptation, plankton, phytoplankton, zooplankton, food chain

Pre-assessment Strategy: non-applicable

Lesson Procedure:

1. Start off by having students write their definition of plankton. If they are unsure, ask them to write down where they think plankton live and a short description of what they look like.

2. Tell students that they will be watching the video "My Secret Life as Plankton", http://ed.ted.com/lessons/the-secret-life-of-plankton, to learn more about the diversity of plankton and their importance to other organisms.

3. Before starting the video, write these questions on the board for all the students to see or hand out a worksheet with the questions on them:

What are plankton?
Where do they live?
How are they adapted to life in the water?
What different kinds of plankton did you observe?
Why are they so important?

4. As they watch the video, tell them to look for the answers to the questions that are posted on the board. Students may take notes if needed to be able to discuss the questions in their groups.

5. After the video assign groups of 2-4 students to do a Think-Pair-Share.

6. Assign a different color sticky note for each group or a different color pen for writing responses.

7. Each group will discuss the above questions and write out their group's responses on sticky notes to place on the board at the front of class. (The supplemental worksheet that is attached to this lesson can be handed out to help guide the discussion.)

8. Each person in the group takes turns being a scribe (writing the group's answer).

9. After completing a question, a student from each group puts their note on the board before going on to the next question.

10. When all the groups have completed the questions, students will report their group's responses to the class. Have students take turns as the reporter for each question.

11. Hold a class discussion after the groups' responses for each question before going onto the next one.

12. Use the questions below for the class discussion:
    Did each group define plankton the same way?
    Do plankton only live in the ocean? What other bodies of water would plankton be found in?
    What adaptations did each group observe in the plankton?
    What characteristics did each group observe that help the plankton live in their environment?
    What are the different types of plankton that each group observed?
    How do phytoplankton and zooplankton differ?
    What are some of the ways that each group defined their importance?

12. After the classroom discussion, each student will complete a Plankton Concept Map to summarize what they learned.

Assessment and Evaluation: Plankton Concept Map needs to include: what plankton are, where plankton are found, the large diversity in types of plankton including the two main types - phytoplankton and zooplankton, and their importance to the ocean food chain. Have students include a bubble on something surprising they learned about plankton or how their definition of plankton has changed. Should have at least 5-6 bubbles.

Alternative assignments: For elementary students, have them draw one of the planktons they observe and describe what it eats, how it moves, protects itself, and how it interacts with other organisms.

For high school students, include higher order questions such as: Why are many of the plankton translucent? What are the cilia used for?
Have them compare and contrast the differences between phytoplankton and zooplankton.

Next Generation Science Education Standards:
Life Science

- LS1A: Structure and Function
- LS2A: Interdependent Relationships in Ecosystems
- LS3B: Variation of Traits
- LS4C: Adaptation

Ocean Literacy Principals:

- Essential Principal 4 - The Ocean Makes Earth habitable

Concept a - Most of the oxygen in the atmosphere originally came from the activities of photosynthetic organisms in the ocean

- Essential Principal 5 - The Ocean supports a great diversity of life and Ecosystems

Concept a - Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale.

Concept b - Most life in the ocean exists as microbes. Microbes are the most important primary producers in the ocean. Not only are they the most abundant life form in the ocean, they have extremely fast growth rates and life cycles.

Concept d - Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

Arizona Standards:

Science Strand 1: Inquiry Process

C1: Observations, Questions, and Hypotheses

Formulate questions based on observations.

C4: Communication

Communicate verbally or in writing the results of an inquiry.

Communicate with other groups or individuals to compare the results of a common inquiry.

Science Strand 4: Life Science

C1: Structure and function of organisms

Understand the relationships between structures and functions of organisms.

C3: Populations and Organisms in an Ecosystem

Analyze the relationships among various organisms and their environment

C4: Diversity, Adaptation and Behavior

Identify structural and behavioral adaptations.

Writing Strand 3: Writing Applications

C2: Expository

Record information (e.g., observations, notes, lists, charts, map labels and legends) related to the topic.

Resources: "My Secret Life as Plankton" directed by Tierney Thys is part of a series called the *Plankton Chronicles*, which offer a variety of videos on Plankton. Information can be found here:
http://www.planktonchronicles.org/en

Author:
Sue Cullumber
Howard Gray School
7575 E. Earll Dr., Scottsdale, Arizona, 85251
scullumber@cox.net

Created on: August 3, 2013

Supplemental Worksheet – for guiding group discussion

After the video "My Secret Life as Plankton", you will be working in groups of 2-4 to discuss your responses to the questions.

Group Name

_____

Now as a group discuss the questions that you received at the beginning of the film. Decide on a group answer for each of these. Each person in your group will take turns being a scribe. The scribe should write the answer on a sticky note and then put it on the board when completed.

•What are plankton?

Did everyone define it the same way?

Come up with one definition for your group.

•Where do they live?

Come up with as many places as you can.

•How are they adapted to life in the ocean?

What are some of the characteristics that help the plankton live in their environment – think about shape, color, appendages (legs, arms, fins, …)

•Are all the plankton alike?

What different kinds of plankton did you observe in the video?

•Why are they so important?

What is their importance to other organisms in the ecosystem?

What is their importance in the food chain?